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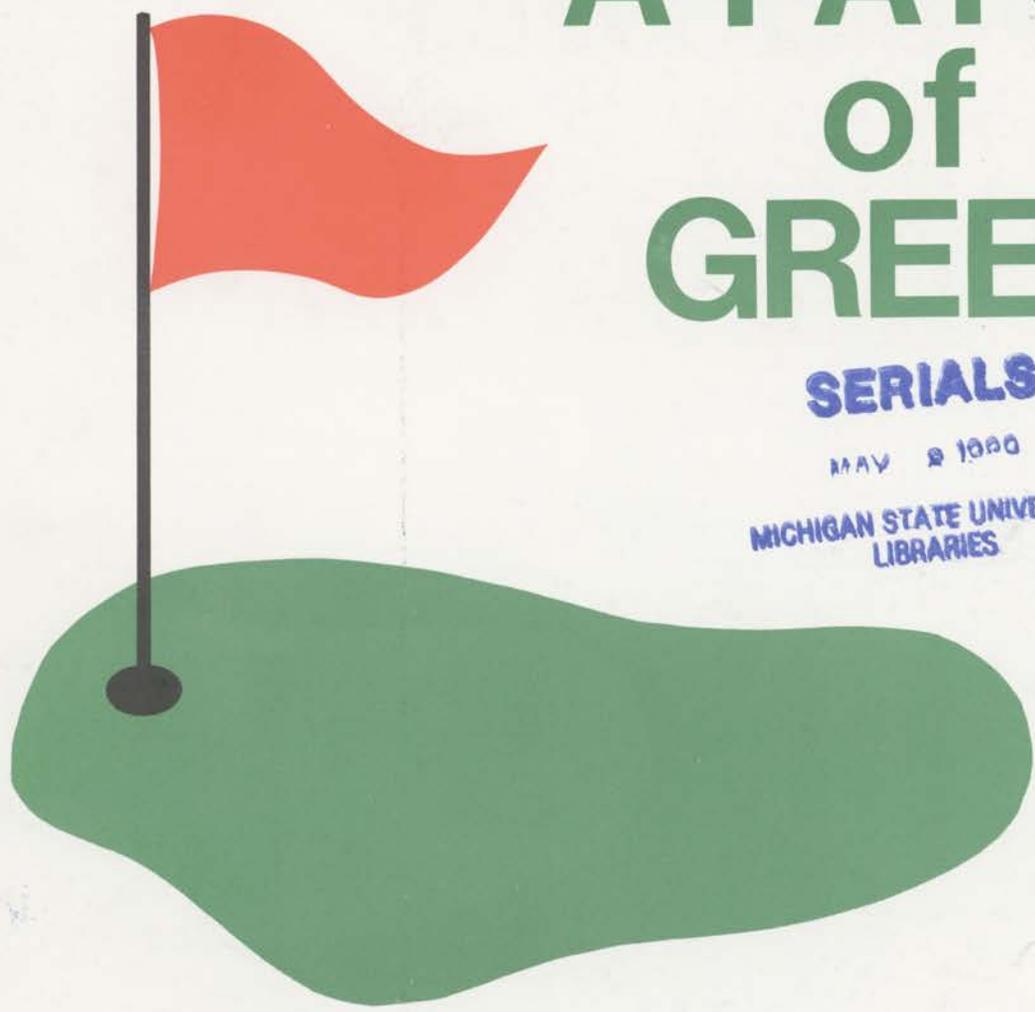
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# A PATCH of GREEN

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# GOLF COURSE MECHANIC

## THE UNSUNG HERO



The past ten years have brought about tremendous change in the equipment that golf course superintendents use to maintain their golf courses. Tractor drawn, ground driven units for use on fairway turf and certain rough areas are virtually a thing of the past. The trend to use lightweight mowers in the three and five unit classification on fairway turf has been established and appears here to stay.

Golf Course Superintendents seem to be cutting all fine turf areas at lower heights, which puts a premium on a sharp, properly adjusted, well maintained machine. The person generally responsible for the overall performance of a mowing machine and other golf course equipment is the Golf Course Mechanic.

Many golf courses today have equipment inventories that easily exceed \$300,000 in replacement cost. Included in the inventory are many specialized pieces of equipment which require all together different preventative and daily maintenance. Mowers of varying types and styles, tractors, transport/utility vehicles, spray appa-

ratus, aerators, trucks, trap rakes, weed eaters and sod cutters. The list could go on. Maintaining all the above mentioned equipment in proper operation condition sounds like a large responsibility. It is.

The majority of golf course maintenance operations need a full time mechanic. The Golf Course Superintendent doesn't usually have time and is not paid to be the hands on mechanic. The superintendent's time is to be devoted to managing and maintaining his golf course.

A qualified Golf Course Mechanic should have a thorough understanding of internal combustion engines, both two and four stroke, reel mower maintenance and adjustment, and spraying apparatus maintenance and repair. Some knowledge of hydraulic system maintenance and repair is very helpful since so many machines are using hydraulics as a power source.

The equipment maintenance area where the mechanic spends many hours should be neat and clean. A good supply of the proper tools with easy accessibility should be available. Tools should not leave

the shop unless the mechanic needs them in the field.

The parts area should be stocked with often used items, plus a supply of items that habitually utilized Murphy's Law, should be kept on hand.

Finding a mechanic that meets your specifications is indeed a tough task. What is a good way to find and keep that "Great Mechanic" we are all hoping for?

One possibility is to hire a vocational school student whose schooling has covered the basics, and by utilizing local equipment dealers to train a person on how to maintain the specific equipment you have in inventory. Also there could be someone on your existing crew who with some extra effort and training could work into the position.

I feel that we as Golf Course Superintendents, through the use of proper communication channels with our committee chairman or Board of Directors can have the funds allocated to properly train and educate our Golf Course Mechanic. Once the Superintendent feels comfortable with the mechanic's abilities, the mechanic should be compensated adequately for his skill and efforts. After all, the mechanic's position is a very important one.

When viewing your golf course and the greens are rolling well, fairways striped to perfection and equipment breakdowns are at a minimum remember your mechanic. He can make your whole operation run much more efficiently.

Charlie Cross, Three Rivers Green  
December, 1987

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# Bush, Congress and the Environment: Assessing the Legislative Climate

A Report to the Membership  
From the GCSAA Government Relations Committee  
William R. Roberts, CGCS, Chairman  
January 20, 1989

The weather vane on top of EPA headquarters began to swing around on Inauguration Day as a combination of factors - most significantly George Bush's election - indicated that the environmental winds in the United States were starting to shift.

Considering Bush's pre- and post-campaign statements ("I am an environmentalist") and the strengthening of the Democrat's control of Congress (they now hold a 55-45 Senate majority), many believe that the "hands-off" environmental policies of the last eight years are on their way out.

Other factors support a major policy swing on the environment: Bush has talked about making EPA a Cabinet-level department — and some insiders now say that any piece of legislation addressing an environmental protection issue will get Senate consideration this year. That assertion is reinforced by the selection of Sen. George Mitchell (D-Maine) as Senate majority leader. Mitchell, a supporter of "hard-core" environmental positions, will control the flow of legislation through the Senate.

The selection of EPA's new administrator, William K. Reilly, is another indication that Bush is taking his commitment to environmental issues seriously. Reilly comes to EPA from three years as head of the World Wildlife Fund — U.S., an organization known for negotiating economically sound solutions to environmental disputes. He also presided over the Conservation Foundation, a research and policy "think tank" credited with finding methods of direct cooperation between business and conservationists.

For those reasons, Reilly is being called a "consensus builder with consensus support" who will seek to establish a "productive dialogue" with regulated industries. Cooperation, not confrontation, may be the thrust of his tenure at EPA.

Whether or not environmental change takes place under President Bush will depend largely on the price tag. Bush faces mounting pressure to erase the budget deficit, lower the trade imbalance and make a dent in the national debt — all, according to his campaign, without new taxes. Obviously, those pressures are not conducive to funding expensive new environmental programs or to increasing the EPA's enforcement budget.

However, even if Bush cannot find the money to enact major federal environmental protection programs, the new president has already succeeded in making the environment a high-profile issue. Because of his attention, the media and the public have renewed their interest in environmental topics. Their concerns about "big" issues like global warming, waste proliferation and air pollution are sure to have trickle-down effect on the regulation of golf courses.

That effect could be magnified if Bush continues EPA and OSHA policies that shift more regulatory and oversight responsibility to state and local governments. In a general climate of environmental concern that kind of grass-roots activism could stimulate the potential for more local restrictions aimed at specific targets like golf courses.

## Issues: What's Ahead?

The final days of the last congressional session saw action on several pieces of legislation affecting golf course superintendents and their operations. Most important among these was the passage of "FIFRA Lite," a compromise package of FIFRA revisions that failed to address several controversial issues. From GCSAA's perspective, the main question left open by FIFRA Lite is groundwater contamination.



## "A PATCH OF GREEN"

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March 7, 1989

To: Turf Advisory Service Subscribers  
Great Lakes Region  
USGA Green Section

Gentlemen:

Now that the GCSAA's International Conference and Show has ended and most of the attendees are home, it's time for all of us to think spring, even though our Brown Deer thermometer is back to its normal level of 10 to 20 degrees F.

Let's hope that our Education of '88 will not be consigned to past history files so that we will be better able to cope with the Augusts of the future. It was apparent that golf courses can withstand high temperatures and arid conditions, as long as the water holds out. The problem lay in water and soil management when evaporation/transpiration is shut down while temperatures remain high. Water application and air drainage became critical factors in intensively maintained areas such as greens and tees. Last season we saw, early on, how far tree root systems extended - much farther than the drip line. Their influence on irrigation patterns were quite visible throughout the Region. Later in the season the adverse influence of forest-like conditions to air movement across turf surfaces became equally obvious. This is not a call for massive lumbering operations, but in some cases the health of the turf has been seriously impaired by trees. And let's not forget that our most desirable grasses need a fair amount of sunlight for survival. Current practices on greens do not leave much functioning leaf surface. To look at this another way, perhaps the best turf for tree-fringed, shaded areas on golf courses, especially greens and tees, is **Poa Annu**a, if the fungicide budget is adequate.

Observations throughout 1988 also proved that properly built greens with laboratory-determined topmixes withstood the environmental and cultural stresses better than any others. That means that

"Green Section Specifications" were followed in their entirety. Remember, there is **no such thing** as a "Modified" Green Section green.

The guidelines for proper construction method are being printed at this time and should be available soon. A copy will be sent to every USGA member organization and additional copies can be obtained from any Green Section office.

To complement that publication, a video tape has been produced to illustrate the procedure. It should be available in the next few weeks, at a cost of only \$20 to \$25. It will run about 30 minutes and is in a format for use by superintendents, golfers, and architects. We reviewed the tape in Anaheim and feel that it will meet the needs of organizations considering building or rebuilding.

There are a number of fine old greens which have served golfers admirably for many years. To meet the needs for today's play, however, their foundation is inadequate for the superstructure and they **need** to be rebuilt. Detroit Golf Club has taken the lead in this by rebuilding the internal structure of all greens while retaining the Donald Ross topography of most. The turf industry continues to benefit from splash-overs from agriculture. New chemical products are being made available to do some jobs better than ever before. They are not salvation in a bottle, though. We will have to know and use all the practices needed to grow healthy turf.

The Green Section exists solely to provide informational assistance to golf operations by working with golf course superintendents. We, too, are employees of your organization and function through a cooperative accommodation with everyone involved. Our commitment to you is to help your course management team provide the best possible playing conditions for your golfers, within the fiscal and physical constraints imposed on the operation.

I am looking forward to visiting you at a mutually convenient time this season. If we can be of any assistance until then, don't hesitate to call.

Sincerely,  
James M. Latham

P.S. If you haven't sent your 1989 subscription yet, remember that the best rate is obtained prior to April 15. Later subscriptions become progressively more expensive, because special schedules to a specific course add to our cost of operation.



## THE GRASS WON'T DO IT YOUR WAY

by J. M. Vargas, Jr.  
Turfgrass Pathologist  
Michigan State University

Reprinted from proceedings of the 1988 Canadian Turfgrass Conference — Too often we try to make the turf grow to our specification instead of adapting our practices to those of the turf. We often hear “I don’t believe in using a lot of nitrogen,” “I don’t believe in aerification,” or “I never use phosphorous.” It doesn’t really matter what we believe or what we think. What is important are the needs of the grass plant to survive, especially during the stress periods.

First of all, it is important that we realize turfgrass lives in a dynamic plant community where it is in constant battle with many other plant species for the space it occupies. We have been able to maintain a turf system as a mono-culture, mainly because of the modern-day herbicides available to us. We have many broadleaf herbicides to manage the broadleaf weeds and pre-emergence to manage the annual broadleaf weeds and grasses. However, we do not have a selective means to manage the annual bluegrass with the possible exception of “Prograss,” which is currently unavailable in Canada. Therefore, the main competition for creeping bentgrass under golf course conditions is annual bluegrass, and depending on how we manage the system, we will favor one species over the other.

But before we discuss the cultural requirements of each species, I think there is one fallacy that needs to be corrected. The idea the annual bluegrass is a weak turfgrass species is not true. If it were truly “weak” grass, it would not have persisted as the dominant species on all our older golf courses. It is a very diverse species, with each golf course probably having over 50 different biotypes or cultivars, if you prefer. Some can adapt to high ground while others adapt to low ground. Some can tolerate dry conditions, other wet conditions, some tolerate good soil, and others compacted soil. So, whatever situation presents itself on your golf course, annual bluegrass has a biotype that is adaptable to it. All it needs to germinate and to become established is for a void to occur in the turf through mis-management.

In addition to its tremendous genetic diversity, it also has a greater photosynthetic rate than creeping bentgrass. This means it is more efficient at making energy and compounds it needs for survival.

### Creeping Bentgrass Management

#### CORING

This should be done at the beginning of prolific seed head production by annual bluegrass in the spring.

The roots of the annual bluegrass plants stop growing and begin to deteriorate as all the plants’ energy and carbohydrates are put into seed production. If coring is done at this time, the actively growing creeping bentgrass roots will fill the coring holes. Adequate oxygen will be present in these coring holes for good root growth and the proper uptake of water and nutrients. This should give the creeping bentgrass a competitive edge over the annual bluegrass plant, which will have to try and develop roots in the more denser or compacted surrounding soil where there will not be as much oxygen present for good root growth or adequate uptake of water and nutrients.

#### FERTILIZER

Pennecross and most of the “native” bentgrasses can survive quite well on low to moderate levels of nitrogen. Annual bluegrass is a “nitrogen lover” and does better under high nitrogen fertility regimes. Timing is also important when fertilizing. Applying nitrogen during prolific annual bluegrass seedhead production, where few annual bluegrass roots are functioning, should allow the creeping bentgrass plant to take up the nitrogen. By doing this at a time when the annual bentgrass plant has limited ability to take up nutrients will also help give it the competitive edge to creeping bluegrass by denying the “nitrogen lover” annual bluegrass the nitrogen it needs to survive.

Rhizotron studies have shown creeping bentgrass roots to remain active approximately three weeks longer than annual bluegrass roots in the fall and to start growing three weeks earlier in the spring. Therefore, by applying a late fall application of nitrogen after annual bluegrass roots have ceased activity should again deny the annual bluegrass plants the nitrogen they need to be competitive, while supplying the creeping bentgrass plants adequate nitrogen to survive. An August application is needed to help promote plant growth after the slow down phase in the summer from high temperatures (See Figure 1).

Figure 1.

Month	May-June	July	Aug	Sept	Oct	Nov-Dec
1 lb/1000 sq. ft.	1		½			1

CONTINUED PAGE 20



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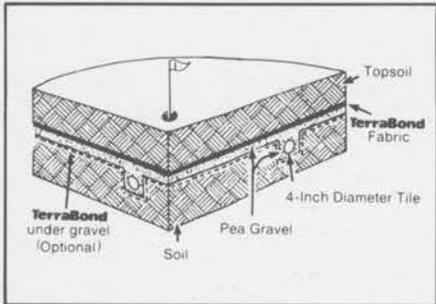


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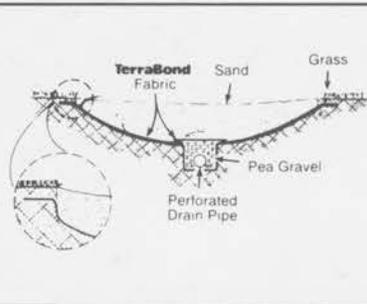
### PUTTING GREEN CONSTRUCTION



Use TerraBond as a replacement for the usual 2" coarse sand layer between the greens mix and the gravel drainfield. The fabric will eliminate downward migration of the mix into the gravel and the subsequent reduction of water flow from the green.

TerraBond's high water permeability and highly engineered uniform density and EOS (AOS) make it an ideal fabric for this use. It will not rot in the soil-water environment. Its horizontal (planar) flow characteristic moves excess water horizontally out to the sides.

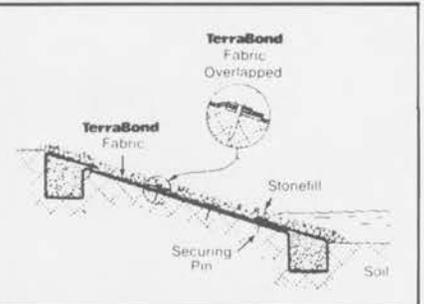
### SANDTRAP LINING



Line the entire golf sand trap with TerraBond, including 6" under the surrounding sod. The sod's roots will knit the fabric to the soil beneath. Clay and rocks will be totally restricted from moving up into the sand.

Sand wash-down in rainstorms will be dramatically reduced, because TerraBond interrupts the interface of sand/soil. Rakeup will be greatly reduced. Time will be saved. Also, "wrap the gravel" in the trap drain to keep it flowing indefinitely. TerraBond's polyester will resist chemical and ultraviolet degradation.

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# SULFUR AND THE BLACK LAYER

Lee Berndt, Joe Vargas, Jr. and Brad Melvin  
Department of Botany and Plant Pathology  
and the Pesticide Research Center  
Michigan State University

Black Layer forms in turfgrass soil when metal sulfides precipitate from soil solution and deposit on soil particles and organic matter. Iron sulfide (FeS) is probably the most common metal sulfide in black layer, but it is certain that other forms, such as manganese sulfide, exist.

Metal sulfides form from a bacterial respiratory process known as dissimilatory sulfate or sulfur reduction. This is essentially bacterial respiration in the absence of oxygen. In sulfate reduction, electrons from food burned for energy by the bacteria are passed to sulfur instead of oxygen, forming hydrogen sulfide. Hydrogen sulfide is very poisonous and also very reactive with metals such as iron. Thus, if hydrogen sulfide is produced and iron is present, metal sulfides will be formed. More importantly, if hydrogen sulfide is produced the potential for the decline which frequently accompanies black layer increases. This is because hydrogen sulfide is a respiratory toxin which blocks electron transport.

Hydrogen sulfide is formed only in the absence of oxygen. Thus, conditions which favor oxygen depletion also favor sulfide formation and black layer development. These conditions include waterlogging, high rates of respiration from microorganisms, compaction, and addition of compounds such as elemental sulfur. The chemistry of sulfur is such that its most stable state is sulfate. In order for sulfur to become sulfate it must acquire 4 oxygen atoms for each sulfur atom. When this occurs in turf soils, it happens at the expense of aerobic microorganisms and turf plants.

Management of black layer lies in prevention. There are several things you can do to prevent the creation of conditions necessary for sulfide production hence black layer formation. Control the amount of irrigation applied to your soil. The easiest way to achieve

conditions in soil where oxygen is deficient is by adding an excess of water. There may be nothing you can do about torrential rain but you can control your irrigation regime. Also, control the amount of sulfur applied to your turf. Pay attention to the sulfur content of micro-nutrient solutions, fertilizers, and fungicides. If you must add sulfur add sulfate and not sulfur. Less black layer forms from sulfate sulfur than from mineral sulfur. It is also better to add nutrients such as iron and phosphorous than to attempt to make them more available by lowering soil pH. Why risk layering by adding large amounts of sulfur when adding these nutrients is so easy?

If black layer has already become a problem do everything you can do to get oxygen into the soil. Core aeration is an effective way to do this. Remove plugs from the turf, and leave core holes open and unfilled. Do not core, however, when your green is overly wet. You will do more damage than good. Allow your soil to dry out as much as possible. This will encourage oxygen diffusion into soil. Syringing is mandatory for maximum black layer control. Adding potassium nitrate or calcium nitrate will also help. These compounds are good oxidizers and will allow aerobic respiration in soil using nitrate as an electron acceptor. Nitrate in effect prevents sulfate reduction in environments where oxygen is lacking. The state highway department routinely adds nitrate to stagnant water in roadway ditches to stop the smell (from sulfides) and clear up the scum. Also, if black layering has already become a problem do not add organic N sources. Organic matter will intensify sulfide formation and "feed" black layer. Do, however, spoonfeed nutrients, including P and K, to the turf. Nutrition is very important in black layer management.

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# GCSAA NEWS

## NEW GCSAA PROGRAM DESIGNED TO PROTECT GOLF'S ENVIRONMENT JANUARY 1989

Coping with regulatory obligations and managing environmental and safety risks are increasingly being recognized as important professional priorities for today's golf course superintendent.

To help superintendents continue to meet these responsibilities, the Golf Course Superintendents Association of America (GCSAA) has contracted with Hall-Kimbrell Environmental Services, Inc., one of the nation's leading environmental consulting firms, to develop the first comprehensive environmental management program for the golf course industry.

"We want to help superintendents make their golf courses as environmentally pleasant and safe as possible," said John M. Schilling, executive director for GCSAA.

In recent years, federal, state and local environmen-

tal regulations that apply to golf courses have increased dramatically. The rules are complex - sometimes even contradictory - and compliance is often frustrating and time-consuming. The new regulatory compliance audit package allows superintendents to objectively and comprehensively evaluate their own facilities.

"As the superintendent of several municipal courses, I can say that this new program gives me a better opportunity to meet regulatory requirements in a timely fashion and to manage for risks that might have meant liability or fines," said Dennis D. Lyon, CGCS, Golf Division Superintendent for the city of Aurora, Colorado.

The audit package deals with such issues as pesticide usage, storage handling and disposal of containers and rinsates; worker safety, hazard communication standards, proper equipment use; water supplies, use, purity and restrictions applying to irrigation; underground storage tanks; and many more.

The package consists of:

**The Compliance Audit Booklet** - a notebook-style set of checklists containing more than 500 questions that the superintendent answers and then submits to Hall-Kimbrell for evaluation. Results are returned to the superintendent as a "Response Report" detailing specific compliance on the federal and, in some cases, state level. The report also provides additional expert guidance to allow superintendents to find out more on their own.

An instructional videotape, which gives users an

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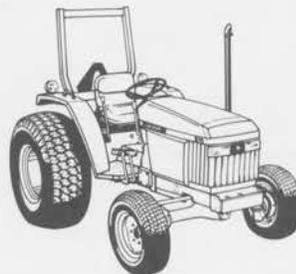
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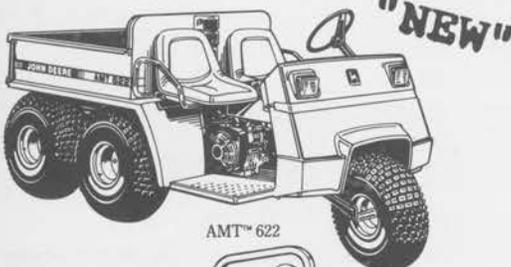
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overview of the regulatory framework affecting golf courses.

**Additional printed material**, giving superintendents more information on the regulations that affect them.

In addition, Hall-Kimbrell will develop on-site follow-up services to help superintendents develop in-house programs to meet or exceed the compliance standards set out in the response report.

"The up-front cost of developing these materials is several thousand dollars, which Hall-Kimbrell has decided to invest," noted Schilling. "The result will be a very valuable new management tool with comparatively low per-audit cost to individual superintendents.

The cost of a privately solicited environmental audit can approach \$10,000. Under this jointly sponsored program, GCSAA member superintendents will pay only \$725.00, Non-members will be charged \$900.00.

For further information, contact Bob Still, GCSAA media relations manager, (913) 841-2240 or (800) 472-7878.

Course Superintendent (CGCS) by the Golf Course Superintendents Association of America (GCSAA).

Miller has been superintendent of the West Bloomfield, Michigan, course since 1977. He lives at 30410 West 14 Mile Road in West Bloomfield.

To become certified, a candidate must have five years experience as a golf course superintendent and be employed in that capacity. The candidate must pass a rigorous six-hour examination testing knowledge of the game and rules of golf, turfgrass management, pest control management, financial management, organizational management and the history, ethics, purpose and procedures of GCSAA. Also, an on-site inspection of Miller's golf course operation was conducted by two currently certified superintendents and former presidents of GCSAA: Ted Woehrle, CGCS, of Troy, Michigan, and Jim Timmerman, CGCS, of Orchard Lake, Michigan.

The GCSAA certification program was instituted in 1971 as a means of recognizing outstanding and progressive golf course superintendents.

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#### MICHIGAN SUPERINTENDENT RECEIVES GCSAA CERTIFICATION

Martin D. Miller, superintendent of Knollwood Country Club, has been designated a Certified Golf

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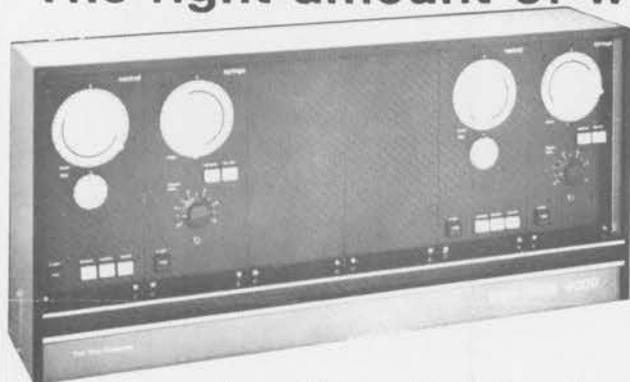
#### GCSAA CERTIFIES 1000th MEMBER

Ronald M. Ross, superintendent of Hillcrest Country Club, Lincoln, Nebraska, has become the

CONTINUED PAGE 24

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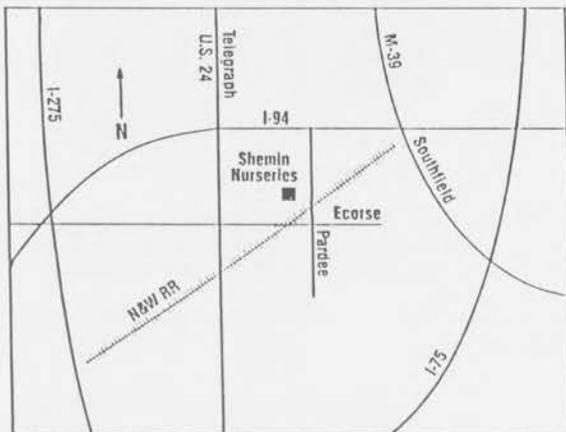
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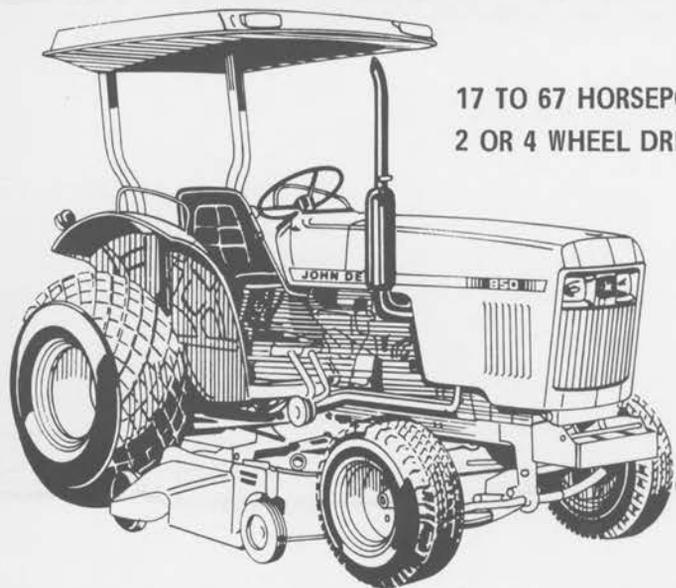
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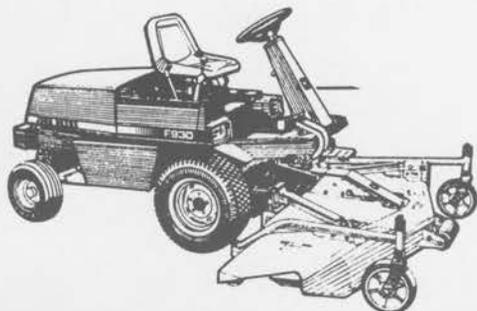
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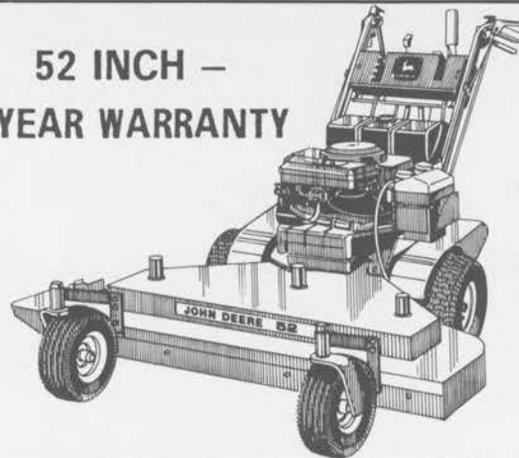
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As turfgrass professionals, we are all aware of the ever-expanding pressures (environmental concerns) on us and our profession. We need concrete answers to our concerns.

Turfgrass research as an industry is an infant. By that I mean our education through research began only about 30 years ago, and has made great progress since then. The only limiting factor in research is monies available and we have a responsibility to support research as much as possible.

The Founders Society was established so individuals have the opportunity to contribute to research as individuals.

MSU has one of the best research staff's in the country and they need our support. The Founders Society is in solid partnership with MSU. In fact the University believes the Society memberships are so vital that donors are recognized as University contributors, there are five different levels of membership and all contributions are cumulative. Join at one level and work your way into another. Lapel pins are

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All contributions qualify for the M.T.F.'s 501-c3 status. You will be contacted by the M.T.F. Founders Society Zone Chairman in the near future. Continue to support MSU and research through your contributions.

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# What Every Budding Gardener Should Know

Condensed from "Gardening"  
Henry Beard and Roy McKie  
Reprinted from Reader's Digest

**Furrow.** Horizontal line on the forehead of a gardener.

**Garden.** One of a vast number of free outdoor restaurants operated by charity-minded amateurs to provide healthful, balanced meals for insects, birds and animals.

**Green Thumb.** Common condition suffered by gardeners in which the skin of the thumb develops a greenish hue from handling large amounts of currency at nurseries.

**Hoe.** Gardening tool whose name derives from the fact that when its blade is stepped on, its handle delivers a sharp rap to the gardener's brow, at which point he cries "Ho!"

**Hose.** Crude but effective and totally safe type of scythe towed through gardens to flatten flower beds.

**Mulch.** Material placed around the base of a plant to keep it moist and warm. Wood chips, leaf matter and even unwanted printed matter may be used. (Note: The Paper on which this article is printed contains colored ink and may damage plants).

**Nursery.** The only known place where money grows on trees.

**Perennial.** Any plant which, had it lived, would have bloomed year after year.

**Pest.** Any creature that eats green vegetables voluntarily.

**Potato.** The ideal vegetable. Not bitter, stringy, pulpy, sour or gritty. It can be boiled, fried, baked, roasted, creamed, mashed or hashbrowned. It is even tasty served as a salad. Best of all, since potatoes of excellent quality are available the year around at reasonable prices, there is absolutely no reason whatever to grow them — in fact, there is a very good reason not to.

**Potato Beetle.** The very good reason not to.

**Root.** 1. Subsurface part of a weed inadvertently left in the ground when the upper portion is removed, thus resulting in the weed's speedy regrowth. 2. Subsurface part of an ornamental shrub, or tree, a small portion of which is inadvertently left in the ground when the specimen is transplanted, thus resulting in the plant's rapid death.

**Rose.** Beautiful and fragrant flower, of which there are thousands of hybrids. Most common garden type is a specimen with a tight, six-inch cluster of short, thick, brownish stems with large thorns, bearing a shiny metal tag.

**Rot.** Gardening advice.

**Seed.** Highly nutritious form of bird food sold in handsome packets.

**Stake.** Hard, tasteless garden product that generally

constitutes the bulk of the harvest after visits by raccoons, rabbits, birds, squirrels and deer.

**Tools.** Gardening implements that have a distinct life cycle: active phase (1 to 12 weeks), marked by appearance of blisters on hand and bruises on legs of user; metamorphosis phase (12 to 14 weeks), during which the handle suddenly breaks at the point where it is joined with the metal working-end; and dormant phase (14 weeks to 20 years), spent by the two halves of the tool in a dark corner of a shed.

**Weed.** Any plant that will survive at least one week without being watered, fertilized, pruned, sprayed, staked, mulched, misted, dusted, or wrapped in burlap, paper or plastic.

**Yard.** Dusty open area where hard labor is performed.

**Zzzz.** 1. Sound produced by dozing gardener. 2. Sound produced by bee trapped in dozing gardener's pant leg.



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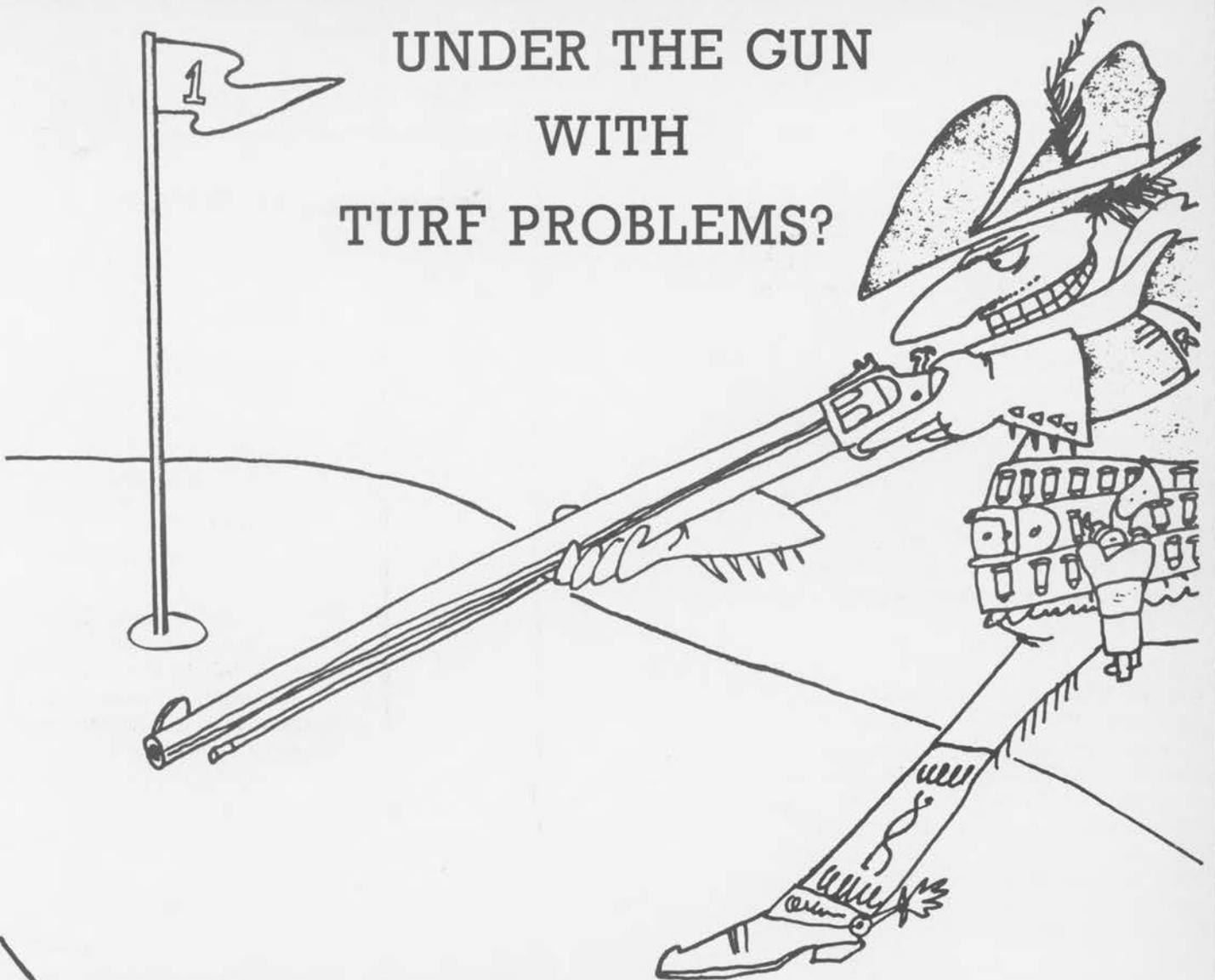
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**VERTICAL MOWING**

Vertical mowing should be done lightly every week from late May through September to prevent scalping of the traditional thatch that creeping bentgrass tends to develop during the warm weather.

**PGR**

Cutless will selectively stop the growth of annual bluegrass while allowing the creeping bentgrass to keep on growing. When used in combination with overseed, it could greatly increase the amount of creeping bentgrass in your fairways.

**COLLECTING CLIPPINGS**

This has led to the single greatest improvement in fairway management. It has also led to an increase in creeping bentgrass content in fairways, probably due to lower nitrogen levels as well as to the beneficial effects of removing the clippings during the warm weather of summer. This prevents the clipping from breaking down rapidly and releasing toxic products which can thin the creeping bentgrass and allow the annual bluegrass to germinate and fill in the voids in the fall.

**Annual Bluegrass Management**

**AERIFICATION**

Aerification should be done three times a year if possible. The first time should be early in the spring after green up, the second in the spring after heavy seed production, and then later in the summer when the cool night temperatures return. If only one aerification can be done, the one following prolific seedhead production is the most important. The roots of the annual bluegrass plants stop functioning during this period, as all the plant's energy is transferred to seedhead production, the plant has only 2 to 3 weeks to develop a root system to get it through the summer stress period.

**PGR**

Embark applied at low rates between 70 and 90 degrees F, using a base 50 degrees F will prevent seedhead production and allow the annual bluegrass to continue good root development in the spring and to store energy needed to survive the summer stress period.

**VERTICAL MOWING**

Vertical mowing should be done deeply in the spring to promote juvenile plants, which should be better suited to survive the summer stress period. This will also supply aerification for better root growth.

**COLLECTING CLIPPINGS**

For the reason mentioned under creeping bentgrass, and as stated before, this is the single greatest discovery for fairway quality. This has been demonstrated over the past twenty years, since we started spraying fairways with fungicides.

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## "GREENKEEPER" vs. "GREENSKEEPER"

Historically, the "green" referred to the common, a smooth grassy area or plot open to the use of all. By extension, when the green came to be used for golf, the caretakers of the course were known as "greenkeepers." It is important to note that the term "green" was inclusive, comprising the entire golf course (excluding designated hazards). This connotation has survived in the **Rules Of Golf**, which refer to the course of play as "through the green."

By folk etymology, however, the comprehensive term "the green" came to be replaced by the more circumscribed application, "greens" — referring to a course's putting surfaces. Thus, the erroneous term "greenskeeper" has gained a foothold in popular usage.

This development can be traced in the game's literature. **The Golfer's Manual**, 1857, states that "green" refers sometimes to the links, but more generally to the putting-ground. **The Golfer's Handbook** of 1881 took the reactionary position, however, that the term referred first to the whole links and second to the putting-ground. A contemporary (1980)

reference work, **Davies' Dictionary of Golfing Terms**, states unequivocally that the term "greenskeeper" is erroneous, while citing numerous literary examples of both proper and improper usage.

It is our feeling that the battle lines on this issue can be demarcated nationally: "greenskeeper" seems to be an Americanism which is seldom, if ever, employed by the British — who, after all, nurtured the sport in its infancy and conceived the terminology.

It is both ineffectual and myopic to attempt to deter the natural evolution of the language. On the other hand, some linguistic developments may be unnatural and ought to be resisted. We here at **Golfiana** are unapologetic traditionalists. The earlier and more fundamentally correct "greenkeeper" will forevermore be the standard usage within these pages.

Bud Dufner  
**GOLFIANA**, The International  
Journal for Golf Historians  
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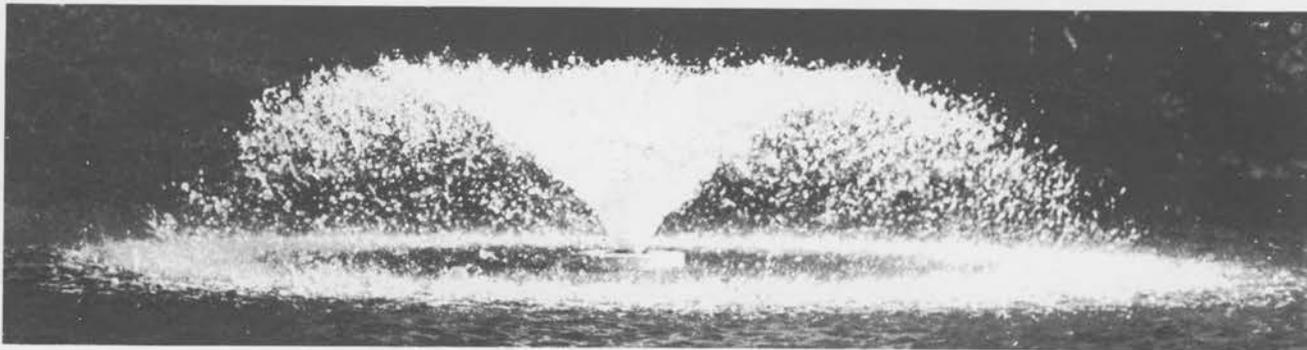
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## ATTACKS ON MICHIGAN APPLES MISS THE MARK

Recent attacks on apples treated with the growth regulator Alar miss the mark, balanced scientific evidence indicates.

Michigan State University's Extension Service indicated in a release to all Michigan counties that the results of the mouse-feeding study used in a "60 Minutes" television program would be the equivalent of a human being eating 25,000 lbs. of apples per day. Even at that rate just one in 20,000 mice would develop a tumor, according to EPA risk assessment, and none of the rats would have tumors. . . and the single tumor would be caused by chemical toxicity, not genetic cancer.

Actually, a can of beer has the highest HERP (Human Exposure/Rodent Potency) index of products rated in a University of California published study. An Alar-treated apple, on the other hand, had 30 times less risk than a few pieces of bacon, 300

times less than the risk of eating a peanut butter sandwich a day, 1,000-fold less than the risks associated with eating a single raw mushroom per day and 600 times less risk than drinking a diet cola. The actual figures may be helpful in defending agriculture against seemingly unwarranted attacks. . . and may provide information for people interested in defending the apple-producing segment of Michigan agriculture. Here are the figures:

Possible Hazard [HERP]%	Daily Human Exposure
2.8	Beer (12 oz.)
0.003	Bacon, cooked (100 g)
0.03	Peanut butter (32 g)
0.1	One mushroom, raw (15 g)
0.06	Diet cola (12 oz.)
0.0001	Alar-treated apple

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**GCSAA NEWS, CONT.**

1000th active golf course superintendent to earn the designation Certified Golf Course Superintendent (CGCS) from the Golf Course Superintendents Association of America. GCSAA President Dennis D. Lyon, CGCS, made the announcement at the association's headquarters in Lawrence, Kansas.

Ross has been superintendent of the 18-hole private club since July, 1984. Previously, he worked at the Great Oaks Country Club, Rochester, Michigan, and the Grand Hotel Golf Club, Mackinac Island, Michigan.

The on-site inspection of Ross' golf course operation was conducted by Alan G. Culver, CGCS, Lincoln, Nebraska, and Tom Athy, CGCS, Fremont, Nebraska.

GCSAA, a professional association of golf course superintendents, was founded in 1926 to promote the art and science of golf course management. Its 8,000 members represent the United States, Canada, Mexico and 32 other countries.

For more information contact Bob Still, GCSAA public relations manager, at (913) 841-2240 or (800) 472-7878.

**VARGAS, CONT.**

**FERTILITY**

Annual bluegrass is a nitrogen lover. It require nitrogen to survive and to help it fight off diseases like anthracnose and summer patch (See Figure 2).

Figure 2

June 1 July 1 Aug. 1 Sept. 1 Oct. Nov. 15

(lbs/1000 sq.ft.)	June 1	July 1	Aug. 1	Sept. 1	Oct.	Nov. 15
Option I	1/2	1/2	1/2	1		1
Option II (Slow release)	1-1/2			1		1

(Anthracnose)  
(Dollar spot)  
(Brown patch)

Fusarium Patch  
Typhula Blight

**CONCLUSIONS**

The grass plant won't grow to your needs. You must supply it with its needs. The grass plant lives in a dynamic system and whatever you do with management practices will favor one over the other. You can have creeping bentgrass or annual bluegrass, the choice is yours; it all depends on your management regime.

Credit: Greensmaster, Sept./Oct., 1988

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## BUSH, CONT.

**FIFRA/GROUNDWATER.** Protection of groundwater resources is the hot topic in environmental circles as the Bush administration and the 101st Congress begin work. Contamination issues are central to several new or pending EPA actions (underground storage tanks last November and above-ground storage tanks in spring 1989) and Bush is on record as saying, "I support zero tolerance for groundwater pollution."

Those facts are evidence that the current political muscle of groundwater makes it very likely that the issue will come before lawmakers in some form this year.

Groundwater legislation (e.g. application restrictions and mandatory water quality monitoring) could be attached to pending revisions of the 1985 Farm Bill. It is also possible that groundwater measures could be included under a new flurry of FIFRA revisions. (However, because the late 1988 revisions also reauthorized FIFRA for three years, there is no immediate need for Congress to act.) Finally, lawmakers may choose to introduce "stand-alone" groundwater legislation that creates regulations outside of FIFRA, the Farm Bill or even the Clean Water Act.

In short, in this political climate, action on groundwater is a virtual certainty. The only real remaining question is how much the legislation will affect the golf course management industry.

A tentative provision that excludes golf courses from the Farm Worker Protection Standards, another FIFRA rule, is apparently not as solid as had been thought. Signs from Washington indicate that golf courses could indeed be included under the final EPA rule that will be published in April. GCSAA will continue to support the exclusion, but members may do well to prepare for the "worst-case scenario." Among other things, the new farm worker standards set restrictions on employee re-entry into treated areas and call for health testing for employees who might be exposed to chemical hazards.

Other pertinent issues that could come before Congress this year include:

### OCCUPATIONAL DISEASE NOTIFICATION.

This House "right-to-know" initiative died out last year but will surely reappear again in 1989. The bill would establish a new federal program to identify, notify, monitor and counsel current and former employees who have been exposed to chemical health risks. The most significant part of the legislation would make employers responsible for tracking down ex-employees and telling that they were exposed to risks in their former workplaces.

**CLEAN AIR ACT.** With this act's 1988 sponsor (Mitchell) now sitting in the majority leader's chair, a 1989 version of the bill is sure to come to the Senate floor. Last year Mitchell's bill included provisions on pesticide drift. However, these provisions are largely targeted at aerial spraying by agriculture and may

CONTINUED NEXT PAGE

## BUSH, CONT.

not have a significant impact on golf course users.

**USED OIL.** Legislation that would prevent EPA from classifying used motor oil as hazardous waste will probably be reintroduced this year. The bill, as it was written last year, calls instead for the development of a separate set of somewhat less-stringent guidelines to deal with used oil. These regulations would emphasize safe handling and recycling.

**MINIMUM WAGE.** Proposals on raising the minimum wage were debated in both houses last year, but neither measure gained passage. Introduction of a 1989 bill, probably based on a 50 percent increase phased in over three or four years, is certain.

**PENSION PORTABILITY.** Vermont lawmaker James Jeffords, the sponsor of last year's House bill to allow workers to shift pension contributions to an IRA instead of "cashing out," is now a member of the Senate. In his new position on the Senate Education and Labor Committee, he will have more authority to push for flexible pension rules that could benefit "mobile" workers like superintendents.

**MANDATORY HEALTH INSURANCE.** Sponsored by Sen. Edward Kennedy (D-Mass.), this legislation would require employers to provide coverage for hospital and physician care, diagnostic tests, birth-related expenses, catastrophic illness and mental health services. If passed, the measure would benefit superintendents who don't already receive full health benefits — but it would also make it more expensive for smaller employers to do business.

Time magazine may have provided the best indication of what 1989 will hold for environmental issues. The publication, famed for its "Man of the Year" selection, decided instead to salute the "Planet of the Year." The planet was, of course, the "Endangered Earth."

The magazine's decision is yet another sign that the barometer of environmental activism is rising. Public concern about global risks will be reinforced by a new president who has made it clear the environment is part of his personal agenda. The realities of balancing a federal budget may curtail that agenda, but an overall tone of awareness and willingness to change has already been set. Ultimately, then, the challenge facing GCSAA and its members is to take positive steps to adapt to this shift in the environmental winds before they blow ill for the golf course superintendent.

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**REMEMBER!** You will never be a professional Golf Course Superintendent until your fellow superintendents, your membership and the general public recognize and accept you as one.

Credit: The Georgia Turfgrass News

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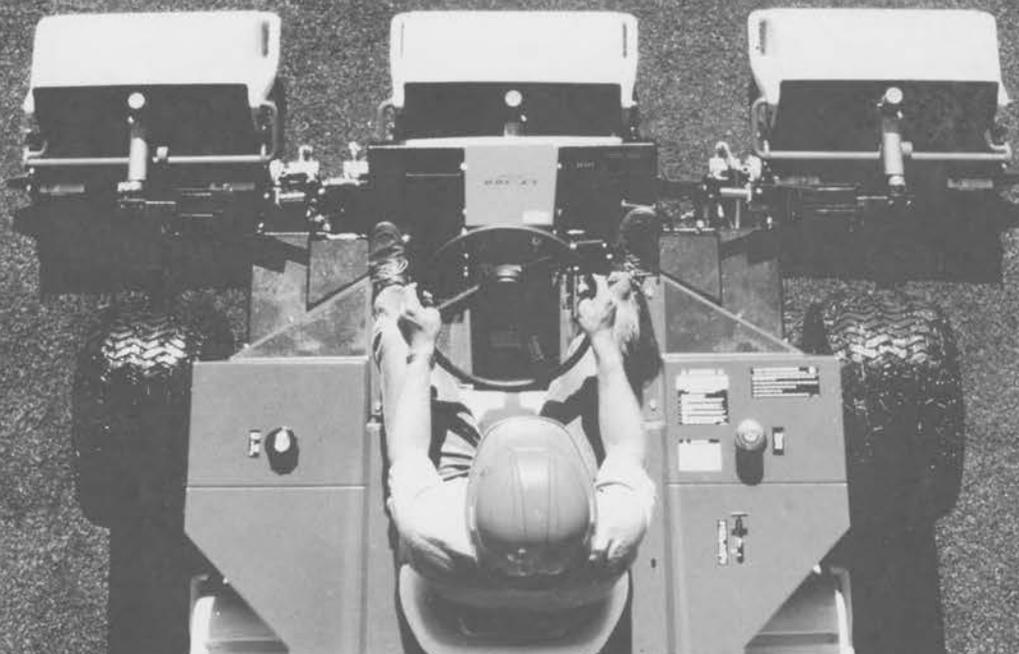
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